Modus Operandi of Medicines
W. C. Brewster

Passed March 9th 1824

8

W. E. H

Dean

A

Summary Dissertation

On The

Modus Operandi

of

MEDICINES

Submitted to the

MEDICAL FACULTY

For The Degree

OF

DOCTOR OF MEDICINE

BY

William Earll Brewster

of

PENNSYLVANIA

require
tion o
every a
So on
taking
necessar
efficien
in scien
ough

To

A. Chapman, M.D.

Respected Sir,

Difficult operations require able hands. So universal is the application of this remark, that it will hold good in every department of science and mechanics. No one for instance will commence an undertaking, to accomplish which great exertion is necessary, unless he is conscious that he possesses a sufficient degree of muscular power. So in science, the solution of abstruse questions is or ought to be committed to competent persons.

If this be true, and the accumulated experience of ages proves it so, what apology shall I offer for engaging in a subject, which notwithstanding all that has been said, is still undeniably wrapt in the most profound and mysterious obscurity; - a subject on which the sun of science has scarcely shed a single beam of light; and a subject which has baffled all the attempts and defeated all the endeavours of the most able, expert and ingenious physiologists to unravel its intricacies. Confessedly, Sir, the Modus Operandi of Medicines is obscure, and requires for its explanation talents of a superior cast. And although my unaspiring genius would not dare advance a single opinion of its own on the subject, yet I trust I may say without danger of incurring the imputation of pedantry, that I can compile the various sentiments which different authors hold, (and

the ar
thus ft
my obje
humble
stage of
faculty
for life
manner
His rest
candid
consider
I feel co
cal cred
myself,
to spend

the arguments by which these sentiments are attempted to be sustained. This is accordingly my object. — But it is not for a Candidate humble as I am, to come forward at this early stage of the case, before a member of that faculty on the issue of whose decision my destiny for life depends, and ostentatiously state the manner in which that object is herein accomplished. This rests alone with you. — And if upon a candid (and impartial examination, you shall consider my compendium worthy of notice, I feel confident that you will give it all that credit to which its merits entitle it. For myself, conscious as I am of my imperfections, I do fend entirely on your indulgence.

I am, dear Sir, very respectfully,

Your obedient servant,

William Carll Brewster

med

nd

heir

medi

hen

had

howe

rein

rest

of t

nor

To explain the operation of medicine, two doctrines at present prevail.

1st. Medicines are absorbed into circulation, and produce their effect by means of the blood.

2d. Medicines operate alone on the solids, their impression being extended through the medium of sympathy, against the first of these hypotheses it most candidly can be said a personal prejudice. This circumstance I have stated not in the least meant to prejudice at the outset to much the authority of their doctrines or the establishment of their doctrine.

In the dark ages of ignorance and delusion, when mental energy

Innovation and a zealous veneration for ancient and a blind deference to magisterial authority, seems to almost dormant. We are therefore not to be surprised to hear of the prevalence of many strange and grotesque notions among which the blood was supposed to undergo changes in quantity, consistence, temperature &c. Hence the origin of the terms, insipidants, attenuants, diluents, refrigerants &c. Opinions, however, so totally groundless were destined to have but a temporary continuance. The increase of knowledge soon exposed their fallacy, and accordingly they were abandoned to all discerning, scientific enlightened minds. Notwithstanding this however, there are still thousands who believe that certain medicines are absorbed into the circulation. Such an opinion appears to me altogether inconsistent with the nature of the blood; and to do

[illegible] that it never was, and never can be proved by any direct or positive evidence.

Every substance that is taken into the stomach, whether aliment or medicine, is acted upon by the powers of digestion. In this process all the original compounds are decomposed, and new compounds are formed. Now it is evident that no medicine can ever be out of absorption in their natural state, because it cannot be absorbed as medicine. If it could, now to detect the [illegible] of the [illegible] would be the insurmountable difficulty, we must either suppose it [illegible] in the stomach, or that the [illegible] has no power of separating the medicine, but were [illegible] both which is known to be the case.

abcr
tract
ari
ind
mient
é
ser
mat
ver
ilo.
ireu
cuel
nedec
on le
cimb

Hence the Zadkiscus absolutely displays a power of elective attraction, amounting almost to fastidiousness; carefully selecting some thing that is noxious, and on, from its active nature, that might in any way, prove deleterious; and so, it is to be hoped that they, in the usual assistance into the circulation which experience and science alone almost certainly deny when introduced artificially. The air is also a real purifier, and thus the circumstances alone which I have mentioned would seem to forbid the probability of medicinal absorption.

But these are not the only grounds on which the doctrine may be combatted. Supposing that the Zadkiscus

[illegible] of regular [illegible] in irritation — the substance absorbed would neutralize the [illegible] constituent, which would take on inflammation, and arrest the further [illegible]. This [illegible] would be the case and a [illegible] explanation of the position we have in the induction of Bubo from the absorption of the [illegible] virus.

But admitting that modes [illegible] for the circulation, the whole mass of [illegible] in this case must be equally charged with the substance, and [illegible] with a salutary action [illegible] or in a diseased or [illegible] other part; the system must suffer. This [illegible] not [illegible] to be the case. Upon a bowl [illegible] stand on the table, if it a [illegible] [illegible] in the [illegible], call Nature so, the substance, and [illegible] may [illegible] one [illegible], while

made it more obvious with all the rest of the same. For example, coarse as it is, it is not less to illustrate my meaning. The reasonableness of the supposition must be doubtless more in certain cases. Why shall a medicine after it has arrived in the blood be determined to any one part in preference to others, (and why shall it not produce its peculiar effect) over or in the whole system? To this very natural interrogatory satisfactory answer never has been given.

"Moreover we know perfectly well that the effects of certain articles are received in a much shorter time than they would be, provided they were absorbed into the circulation. Examples of this fact we have in the almost instantaneous stimulus of ardent spirits, in the poisonous effects of

[illegible] (cinchona.

Years of medicating, indeed, it was reasonable to suppose that it would be found in that fluid. This however does not appear to be the case. In an original Pellatan gave a person a drachm, a scruple, a drachm: but after a lapse, per mort, upon an examination of the blood, no trace could be found in the serum. In addition to this however, we are told by Dr Brande, one of most eminent chemists in europe, that he administered soda to a patient for a long time, and in a large quantity; and then, Mirabile dictu! he detected the substance in the blood; which he might have done had his patient never seen a particle of soda, much less taken it. It is perfectly well known that in a

natural state soda is one of the constituents of blood: (and I am astonished to find that so great a man should understand to be) of a favourite doctrine on such flimsy evidence as this.

In addition to all this it may be stated that extraneous substances of any kind when injected into the circulation produce very serious consequences. The most bland articles, as milk, chyle &c. have been known to occasion distressing effects; and Bichat states that in several cases even a bubble of air caused immediate death. Innumerable experiments have been made on the subject with precisely similar results; so that this point appears to be pretty well settled. And besides, the most zealous upholders of the opposite doctrine do not hesitate to admit the

[illegible] act, [illegible] they attribute it to [illegible] circumstance. Are fatal medicines are absorbed, substances, and accounts [illegible] [illegible] circulate throughout the system with a vital, and with the blood.

With such an overwhelming mass of evidence as this, what unconvincing sceptic can doubt, the operation of medicines [illegible] independent of the circulation? If such an one there is, let him have his doubts removed by the known fact that many substances induce their peculiar effect though the heart and blood vessels be taken away: in that in their case the central and visible entry the circulation. Experiments, the relation of which I am merely transcribing from a known source, (and which I may incidentally remark I am indebted for many of the ideas

The lines erased in pages 13 & 14, were denied by the Candidate, as intending any thing personal to one of the Professors, who objected to the retaining the paragraphs in the Thesis - It was immediately agreed to by the Candidate that it should be erased.

J. R. Loxe. - March 8th 1824

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] on those of the use of bread and [illegible] was effected in reality, [illegible] one in which imagination was not excluded in both.

Disregarding then as I do the evidence of direct experiment, we will proceed to examine some of those circumstances which the supporters adduce in confirmation of endermic absorption.

It is well known that, when some articles, such as Garlic, Onions, &c. are rubbed upon the skin, the odour of these substances is perceived in the breath. Hence it is inferred that they must have entered the blood. Such a conclusion however, is wholly unwarrantable. For one must know that the substance must give out its odour in the stomach as well as in the open air, and that this odour must spread

[illegible]

[illegible]

[illegible] putrid [illegible] acid [illegible], yet the substance is found [illegible] sufficient [illegible] of bile. But neither has the colour or taste [illegible] been [illegible] in the blood [illegible]. [illegible] these circumstances [illegible] but [illegible] because [illegible] substance is found [illegible] carbonic [illegible], [illegible] that it must [illegible] the [illegible] circulation [illegible] state. It is stated by one of [illegible], [illegible] that [illegible] globules [illegible] in the [illegible] can [illegible] that substance [illegible] specific gravity is at least twelve times

[illegible]

[illegible]

[illegible]

[illegible] matter. If rhubarb has been received into the stomach, a few [illegible] of its [illegible] [illegible] [illegible] [illegible] [illegible] old [illegible]. Has rhubarb passed the round of the circulation, or is it [illegible] [illegible] the blood? In a [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] converted into a smaller [illegible] [illegible] [illegible], the urine, the [illegible] [illegible] [illegible] this explanation [illegible] not [illegible] matter, [illegible], but [illegible] absorbed [illegible] [illegible] [illegible] [illegible] experiments. [illegible] [illegible] [illegible] tried [illegible] [illegible] [illegible] introduced [illegible] [illegible] [illegible] [illegible]

[illegible]

[illegible]

[illegible]

(But) Should upon the
[illegible] the circulation be all to the bladder,
[illegible] [illegible] [illegible] [illegible]

[illegible]

[illegible]

[illegible]

[illegible] [illegible] [illegible] [

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] in [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] [illegible]. [illegible] the [illegible] what a [illegible] criticism. [illegible] it in the most bitter [illegible] [illegible] contempt, or cold disdain. [illegible] their [illegible], and "[illegible]" has been [illegible] laurels, [illegible] [illegible] well [illegible], and [illegible] walls of detraction and [illegible], arrayed in all the [illegible] of [illegible], and [illegible] of triumph.

But it is time [illegible] to [illegible] under consideration. [illegible] in the [illegible], and

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] circulation, [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] sympathy. By sympathy, is meant, it is to be understood, that property of the animal economy by which an impression made on one part is propagated to another. This [illegible] [illegible] is caused by [illegible] [illegible] [illegible] [illegible] the nervous [illegible] one to another." The existence of

[illegible] "[illegible] and [illegible] the [illegible] of [illegible] [illegible] [illegible]

[illegible] the nerve of the organ of vision, [illegible] the [illegible] [illegible] [illegible]

[illegible]

[illegible]

[illegible]

very reasonable to suppose that calculations in science should be extended in the same way. But the narrow limits to which I am necessarily confined prevent me going into an argument by which the theory of the Modern Principle of Medicine is supported. Yet, it is clear that the doctrine accounts beautifully for many gradations that take place in the human system. Every one, even good and healthy in any quarter, the brain is altered in its functions of relief, and this effect cannot visibly be accounted for on any other principle than the sympathetic extension of the original local impression.

The reason why a medicine operates upon one particular part in preference to another cannot at all be explained

rather what it is not sure. Certain it is that we in vain look for a similar and appropriate elementary action throughout the case. The circumstance therefore need not astonish us and the doctrine of sympathies is not at all derogative on this account.

On the whole, this mode of explaining the operation of Medicines appears the most intelligible, rational and compatible with the present state of science. And accordingly the opinion is embraced by some of the most ingenious and scientific of physiologists and philosophers.

I have thus in as concise a manner as possible given a condensed account of the principal circumstances connected with the Modus operandi of Medicines.

Mr. Cabot it is true is entirely and altogether speculative; and I fear and may perhaps merit severe censure for engaging in it.

I cannot now conclude without making one more remark. — I am well aware that it has been considered by some a matter of no importance whether we understand the manner in which medicines cure or not. Such a doctrine however is the very bane of science. It gives an unhealthy prostrating sentiment to our meditation and research. It encourages ignorance, holds the flood-gates of error, and limits the torch of enquiry and invention. True it is that when we soar too much on the aerial pinions of theory and speculation, we are

liable to be led into error? But restrained within its proper boundaries, I do maintain that theorizing is perfectly safe: and it is the only possible means of explaining many of the secret operations of nature, shrouded as they are by the opaque caparison of obscurity. Let the consideration then of former achievements stimulate to a more ardent enthusiasm, by which truth may be confirmed and science benefited.

a g
the total
a [illegible]